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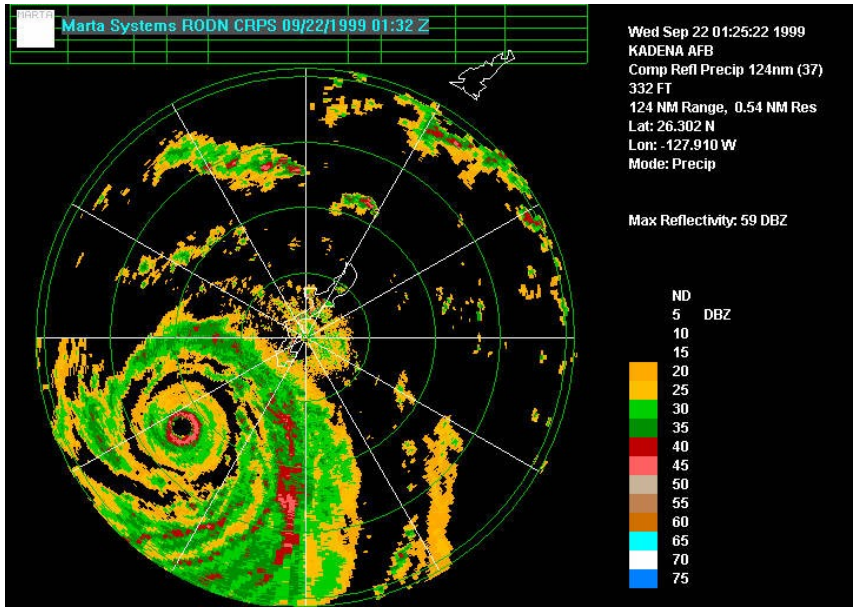
RADAR Reconnaissance



An introduction to Tropical Cyclone reconnaissance using weather RADAR systems

By SSgt Aaron Thomas, JTWC, SATOPS

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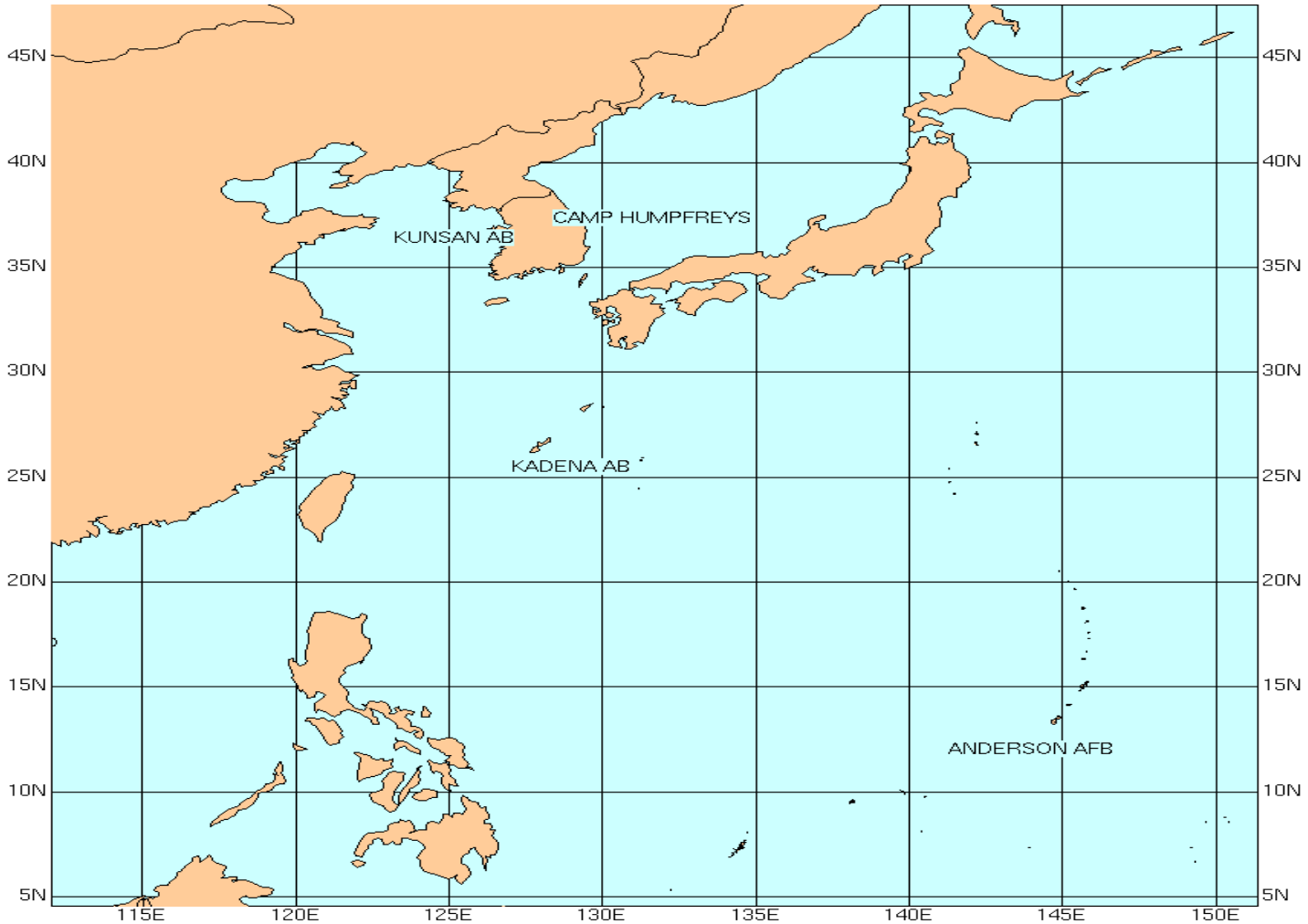
RADAR uses at JTWC

- Objective: To discuss the role and uses of RADAR applications in the TC reconnaissance network.

Topics of Discussion

- NEXRAD and its applications for TC reconnaissance
- AOR RADAR sites
- TDO considerations

WESTPAC NEXRAD SITES



Radar Observations

- JTWC unique
- UCP considerations
- Limitations of NEXRAD fixing
- Suggested procedures

JTWC Unique

- Able to dial-in to all WESTPAC PUP's
  - Very slow
  - No control over UCP
    - VCP, PRF
  - No control over RPS list
  - Difficult to keep current imagery displayed.

UCP Considerations

- The following information is taken from NWS sources at http://www.srh.noaa.gov/mlb/tcplan.html

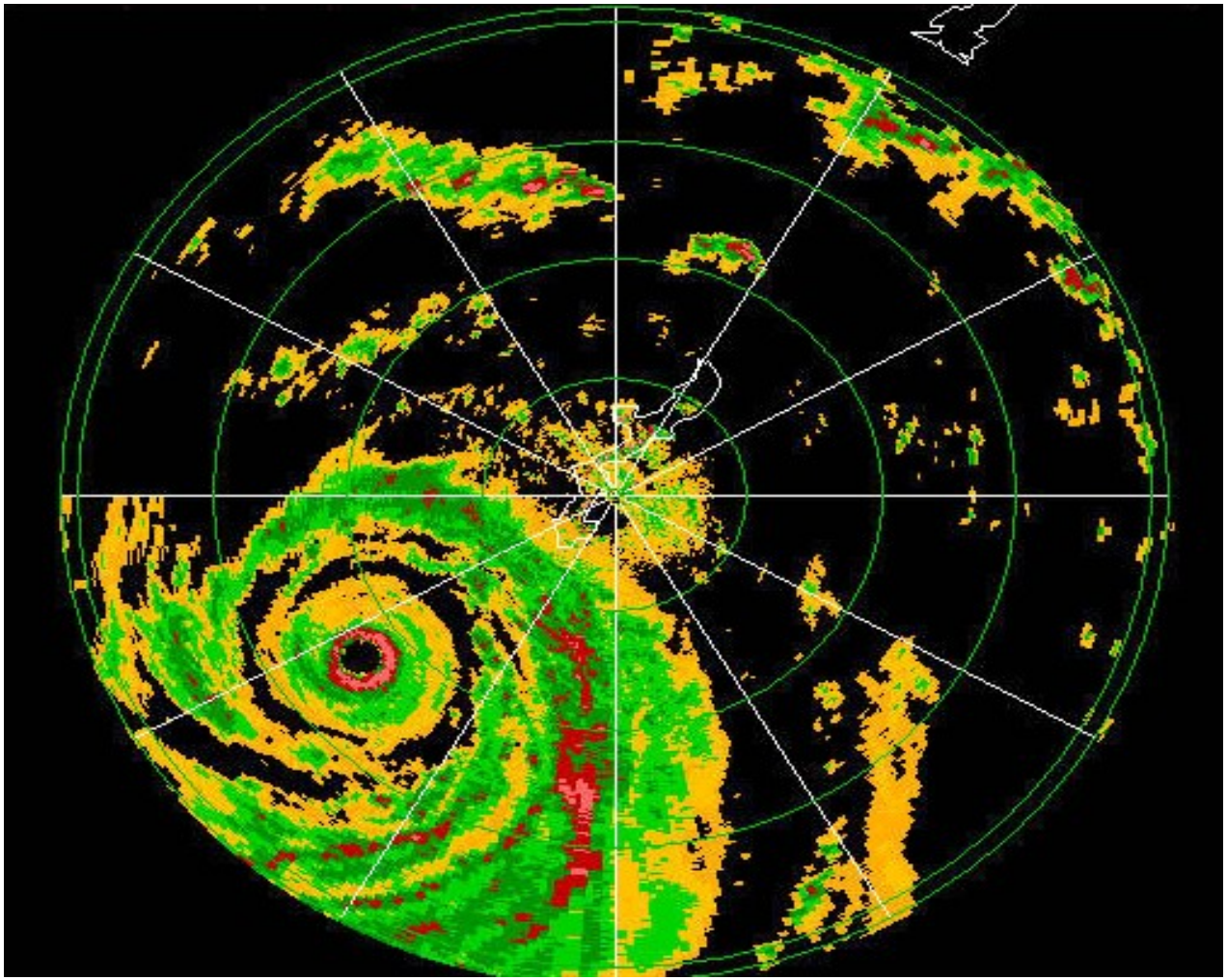
- Most common problems with UCP/PUP operation:
  - Not changing the PRF to PRF #4 to push the Range Folded (RF) area out from the usual 80 nm range (in PRF#5) to 96 nm.
  - Many offices also stay in VCP 21 (6 minutes) scanning mode instead of switching to VCP 11 (5 minutes)
  - To extend the maximum detectable velocity from 123 kt to ~248 kt, the radar must be switched from the 0.97 kt (0.5 m/s) velocity interval to 1.94 kt (1m/s)

Limitations of NEXRAD

- 96nm max range
- Only see the low levels very close to the Radar
- Load shedding during busy periods
- Hard to dial-in during TC landfall due to communication problems
- Very limited coverage
  - only four NEXRADs in WESTPAC
  - Storm has to be nearly on top of RDA to get good data

Some Suggested Procedures

- Suggest using only the .5 elevation angle in both the base reflectivity and velocity products. The .5 slice will show returns under 10k ft up to 96nm away from the NEXRAD
- Follow curved connective bands in towards center
- Use .5 base velocity product to judge wind speeds, however remember that the wind heights increase dramatically away from the RDA
- Upon request, a complete copy of the JTWC RAOB binder will be made available for you to take back to your station

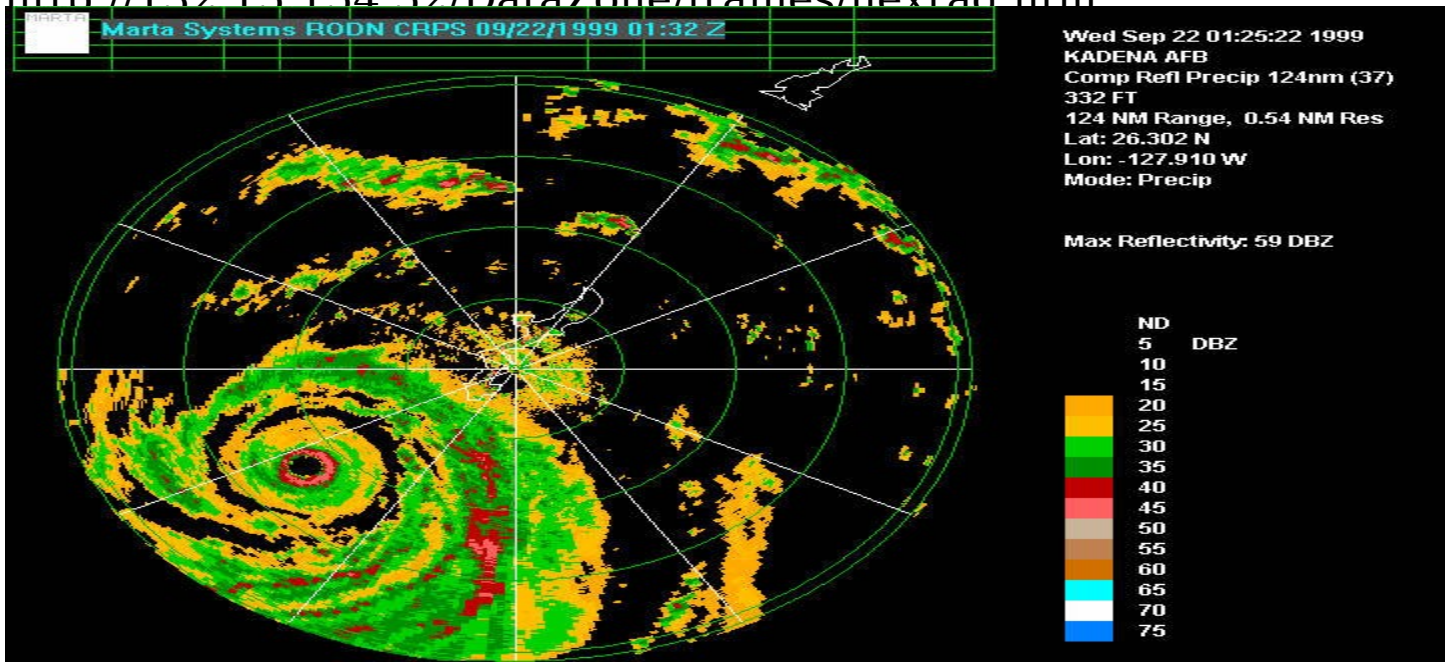


TDO Considerations

- Accurate Fix position
- Description of storm structure
- Range of 35kt wind field
- Max low level winds

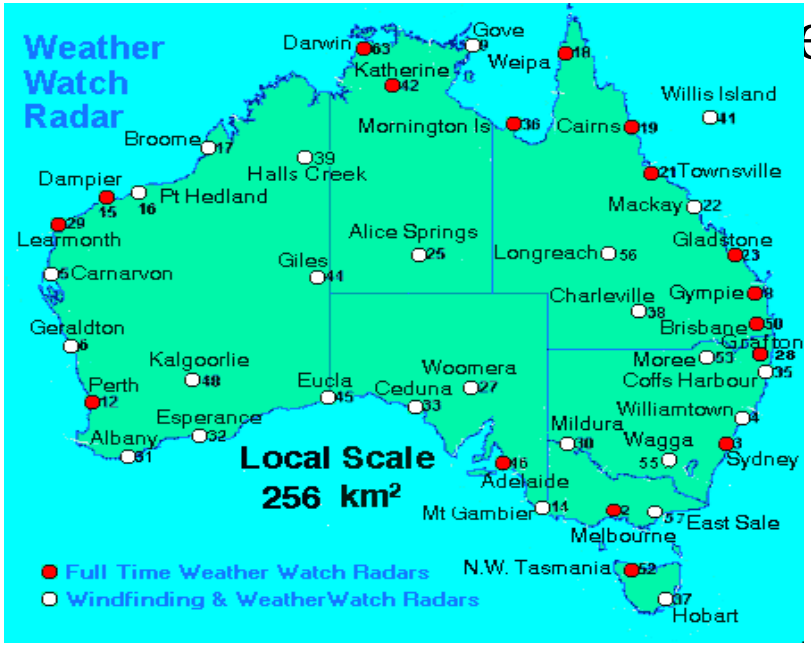
Radar Sites on the WWW

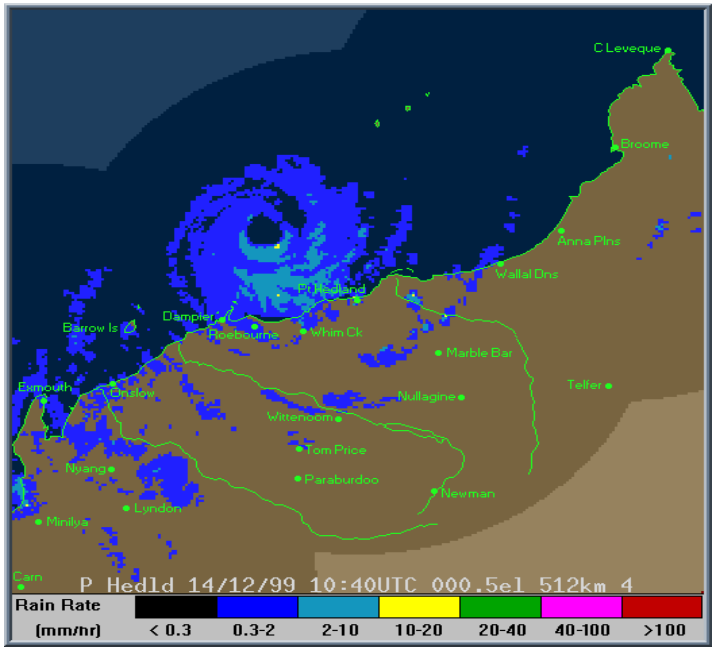
- There is other RADAR information available on the web.
  - Kadena's NEXRAD http://132.15.154.52/DataZone/frames/nexrad.htm



Web Sites (cont.)

- Australian Weather Watch Radar
  - www.bom.gov.au/reguser/by_prod/radar/#map1





Radar Links

- Links with RADAR information
  - http://ww2010.atmos.uiuc.edu/(Gh)/guides/rs/rad/appl/hurr.rxml
  - http://www.srh.noaa.gov/mlb/trop97sms.html
  - http://www.srh.noaa.gov/mlb/tcplan.html
    - info from NWS on RADAR fixing and using products
  - http://wwwmil.kadena.af.mil/weather/JPEG/RODN/CRPS.JPG
    - Kadena Radar

Summary

- NEXRAD RAOBs provide valuable information in TC structure and forecasting
- Ensuring RADAR preparedness with TC approach, greatly increases value of the RAOB
- TCs infrequently within RADAR range, but NEXRAD can provide outstanding information on TC structure.

Thanks to..

- LCDR Stacy Stewart (NHC) for his help and expert advice on NEXRAD applications for Tropical Cyclones.